

[032] Figs. 8A, 8B, 8C, 9A and 9B are representations of the shaft arrangement for different diagrams of a transmission, according to the present invention.

[047] Figs. 8A, 8B, 8C illustrate three possibilities of the positioning of the shafts at the installation with a telescopic handler. As has already been explained, shafts 17 and 5 can be rotated around output shaft 3, shaft 4 can be rotated around shaft 6, and shaft 6 can be rotated around shaft 5.

[048] In Figs. 9A and 9B, two variants of the shaft arrangement regarding an excavator loader with insertable front wheel drive 15 are shown. It is noticed here, that shaft 15 (front wheel drive) can be rotated around output shaft 4; shafts 17 and 5 are able to be rotated around drive shaft 3, so that a very high installation flexibility is ensured.

1-12. (CANCELED)

13. (NEW) A multi-gearred power shift transmission for a construction machine providing improved installation flexibility, the transmission comprising:

- a torque converter (2);
- a drive shaft (3) being drivingly coupled to the torque converter (2);
- a first counter shaft (5);
- a second counter shaft (6);
- a third counter shaft (17); and
- an output shaft (4) for supplying driving power;

and each of the drive shaft (3), the output shaft (4), the first counter shaft (5), the second counter shaft (6) and the third counter shaft (17) having a gear unit comprising at least one of a fixed gear wheel, an idler gear wheel and a shift clutch (8, 9, 10, 11, 12, 13), which couples the idler gear wheel to the respective shaft, such that up to four forward gear ratios and two reverse gear ratios can be engaged;

the gear unit of the drive shaft (3) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5) and a component of the gear unit of the third counter shaft (17);

the gear unit of the first counter shaft (5) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3), a component of the gear unit of the third counter shaft (17) and a component of the gear unit of the second counter shaft (6);

the gear unit of the second counter shaft (6) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5) and a component of the gear unit of the output shaft (4);

the gear unit of the third counter shaft (17) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3) and a component of the gear unit of the first counter shaft (5); and

the gear unit of the output shaft (4) is directly drivingly engagable with at least a component of the gear unit of the second counter shaft (6),

whereby that the transmission provides improved installation flexibility.

14. (NEW) The multi-gearred power shift transmission according to claim 13, wherein the transmission further includes a front wheel drive shaft (15) which drivingly engages with a fixed gear wheel of the gear unit of the output shaft (4) when a shift clutch (14) of the front wheel drive shaft (15) is engaged.

15. (NEW) The multi-gearred power shift transmission according to claim 14, wherein the front wheel drive shaft (15) is permanently coupled to a component of the gear unit of the output shaft (4) so that the output shaft (4) provides both front wheel and rear wheel drive.

16. (NEW) The multi-gearred power shift transmission according to claim 13, wherein at least one of the gear unit of the drive shaft (3), the gear unit of the output shaft (4), the gear unit of the first counter shaft (5), the gear unit of the second counter shaft (6) and the gear unit of the third counter shaft (17) has a second fixed gear wheel which provides the transmission with an increased range of transmission ratios.

17. (NEW) The multi-gearred power shift transmission according to claim 14, wherein the front wheel drive shaft (15) is a part time drive which is engagable, via an idler gear wheel, with the at least one fixed gear wheel of the second counter shaft (6).

18. (NEW) The multi-gearred power shift transmission according to claim 14, wherein the transmission includes an auxiliary drive (16) for driving additional equipment.

19. (NEW) The multi-gearred power shift transmission according to claim 14, wherein the transmission is incorporated into one of a telescopic handler and an excavator loader.

20. (NEW) A multi-gearred power shift transmission of a telescopic handler and an excavator loader which provides improved installation flexibility, the transmission comprising:

- a torque converter (2);
- a drive shaft (3) being drivingly coupled to the torque converter (2);
- a first counter shaft (5);
- a second counter shaft (6);
- a third counter shaft (17); and
- an output shaft (4) for supplying driving power;

and each of the drive shaft (3), the output shaft (4), the first counter shaft (5), the second counter shaft (6) and the third counter shaft (17) having a gear unit comprising at least one of a fixed gear wheel, an idler gear wheel and a shift clutch (8, 9, 10, 11, 12, 13), which couples the idler gear wheel to the respective shaft, such that up to four forward gear ratios and two reverse gear ratios can be engaged;

the gear unit of the drive shaft (3) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5) and a component of the gear unit of the third counter shaft (17);

the gear unit of the first counter shaft (5) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3), a component of the gear unit of the third counter shaft (17) and a component of the gear unit of the second counter shaft (6);

the gear unit of the second counter shaft (6) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5) and a component of the gear unit of the output shaft (4);

the gear unit of the third counter shaft (17) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3) and a component of the gear unit of the first counter shaft (5);

the gear unit of the output shaft (4) is directly drivingly engagable with at least a component of the gear unit of the second counter shaft (6);

whereby that the transmission provides improved installation flexibility; and

an auxiliary drive (16), for driving additional equipment, extends within and through the drive shaft (3).

21. (NEW) The multi-gear power shift transmission according to claim 20, wherein the transmission further includes a front wheel drive shaft (15) which drivingly engages with a fixed gear wheel of the gear unit of the output shaft (4) when a shift clutch (14) of the front wheel drive shaft (15) is engaged.

22. (NEW) The multi-gear power shift transmission according to claim 21, wherein the front wheel drive shaft (15) is permanently coupled to the gear unit of the output shaft (4) so that the output shaft (4) provides both front wheel and rear wheel drive.

23. (NEW) The multi-gear power shift transmission according to claim 20, wherein at least one of the gear unit of the drive shaft (3), the gear unit of the output shaft (4), the gear unit of the first counter shaft (5), the gear unit of the second counter shaft (6) and the gear unit of the third counter shaft (17) has a second fixed gear wheel which provides the transmission with an increased range of transmission ratios.

24. (NEW) The multi-gear power shift transmission according to claim 21, wherein the front wheel drive shaft (15) is a part time drive which is engagable, via an idler gear wheel, with the at least one fixed gear wheel of the second counter shaft (6).

25. (NEW) A multi-gear power shift transmission for a construction machine providing improved installation flexibility, the transmission comprising:
a torque converter (2);

- a drive shaft (3) being drivingly coupled to the torque converter (2);
- a first counter shaft (5, 6, 7);
- a second counter shaft (5, 6, 7);
- a subsequent counter shaft (17); and
- an output shaft (4) for supplying driving power;

and each of the drive shaft (3), the output shaft (4), the first counter shaft (5, 6, 7), the second counter shaft (5, 6, 7), the subsequent counter shaft (17) having a gear unit comprising at least one fixed gear wheel, an idler gear wheel and a shift clutch (8, 9, 10, 11, 12, 13), which couples the idler gear wheel to the respective shaft, such that four forward gear ratios and two reverse gear ratios can be engaged;

the gear unit of the drive shaft (3) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5, 6, 7) and a component of the gear unit of the subsequent counter shaft (17);

the gear unit of the first counter shaft (5, 6, 7) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3), a component of the gear unit of the subsequent counter shaft (17) and a component of the gear unit of the second counter shaft (5, 6, 7);

the gear unit of the second counter shaft (5, 6, 7) is only directly drivingly engagable with a component of the gear unit of the first counter shaft (5, 6, 7) and a component of the gear unit of the output shaft (4);

the gear unit of the subsequent counter shaft (17) is only directly drivingly engagable with a component of the gear unit of the drive shaft (3) and a component of the gear unit of the first counter shaft (5, 6, 7); and

the gear unit of the output shaft (4) is directly drivingly engagable with at least a component of the gear unit of the second counter shaft (5, 6, 7).